IN THE CLAIMS:

Kindly cancel claims 4 and 26 without prejudice or admission and amend claims 1, 24, 25 and 27 as shown in the following listing of claims, which replaces all previous versions and listings of claims.

1. (currently amended) A scanning probe microscope which observes microscopic structures on a sample surface, comprising: a probe responsive to an atomic force generated when brought into close proximity to the sample surface; scanning means for performing raster scanning of the probe along a first scanning axis substantially parallel to the sample surface and a second scanning axis substantially parallel to the sample surface and orthogonal to the first scanning axis of the sample surface and maintaining the probe in close proximity to the sample to cause the probe to move relatively in the direction of a third scanning axis orthogonal to both the first scanning axis and the second scanning axis so as to follow undulations on the sample surface; scanning control means for controlling relative raster scanning of the probe with respect to the sample; and displacement detection means for measuring relative position and displacement of the probe relative to the sample by measuring displacement of the scanning means in the direction

of the second scanning axis or the third scanning axis and outputting a feedback signal based on the detected position and displacement, the feedback signal being used for controlling the probe position; wherein the scanning control means receives the feedback signal and performs feedback control by controlling the probe position in accordance therewith such that the relative position or displacement of the probe with respect to the sample in the direction of the scanning axis having the lower scanning frequency of the first scanning axis and the second scanning axis becomes constant during either an entire period or a portion of a period of scanning in the direction of the other scanning axis having the higher scanning frequency, and the scanning control means includes scanning speed adjustment means for adjusting the speed of the raster scanning in the direction of one of the first and second scanning axes, and sampling pulse generating means for generating sampling pulses at predetermined times.

2. (previously presented) A scanning probe microscope according to claim 1; wherein the displacement detection means simultaneously detects the relative position or displacement of the probe with respect to the sample in the direction of the first scanning axis, the second scanning axis and the third scanning axis; and further comprising a storage

device for storing detection results of the displacement detection means; and a computer for generating an observation image of the sample surface based on the relative position or displacement of the probe with respect to the sample for each of the scanning axes saved in the storage device.

3. (canceled).

4. (canceled).

5. (previously presented) A scanning probe microscope according to claim 1; wherein the scanning control means receives the feedback signal and performs feedback control by controlling the probe position in accordance therewith such that the relative position and displacement of the probe with respect to the sample in the direction of the scanning axis having the lower scanning frequency of the first scanning axis and the second scanning axis becomes constant during one half period of scanning in the direction of the other scanning axis having the higher scanning frequency.

6. (previously presented) A scanning probe microscope according to claim 2; wherein the scanning control means performs raster scanning control such that a scanning range of the sample surface in a direction of at least one of the first scanning axis and the second scanning axis is larger

than and includes a range of the sample surface being observed.

7. (previously presented) A scanning probe microscope according to claim 6; wherein the scanning control means performs raster scanning control such that a scanning range of the sample surface in a direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis is larger than and includes a range of the sample surface being observed.

8. (previously presented) A scanning probe microscope according to claim 7; wherein the displacement detection means commences sampling and storage of relative position and displacement values of the probe relative to the sample in a direction of the first scanning axis, the second scanning axis and the third scanning axis at a predetermined sampling period, at the time the relative position and displacement of the probe with respect to the sample in a direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis enter a range being observed.

9. (previously presented) A scanning probe microscope according to claim 7; wherein the displacement

detection means commences sampling and storage of relative position or displacement values of the probe relative to the sample in a direction of the first scanning axis, the second scanning axis and the third scanning axis at a predetermined sampling period at a point in time when the rate of change over time of the relative position or displacement of the probe with respect to the sample in a direction of the scanning axis having the higher scanning high frequency of the first scanning axis and the second scanning axis becomes constant or becomes a predetermined value.

10. (previously presented) A scanning probe microscope according to claim 7; wherein the displacement detection means commences sampling and storage of relative position or displacement values of the probe relative to the sample in a direction of the first scanning axis, the second scanning axis and the third scanning axis at a predetermined scanning period at a point in time when two conditions occur, the first condition occurring when the relative position or displacement of the probe with respect to the sample in a direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis enters a range being observed, and the second condition occurring when the rate of change over time of the relative

position or displacement of the probe with respect to the sample in a direction of the scanning axis having the higher scanning frequency becomes constant or becomes a predetermined value.

11. (previously presented) A scanning probe microscope which observes microscopic structures on a sample surface, comprising: a probe responsive to an atomic force generated when brought into close proximity to the sample surface; scanning means for performing raster scanning of the probe along a first scanning axis substantially parallel to the sample surface and a second scanning axis substantially parallel to the sample surface and orthogonal to the first scanning axis of the sample surface and maintaining the probe in close proximity to the sample to cause the probe to move relatively in the direction of a third scanning axis orthogonal to both the first scanning axis and the second scanning axis so as to follow undulations on the sample surface; scanning control means for controlling relative raster scanning of the probe with respect to the sample; displacement detection means for measuring relative position and displacement of the probe relative to the sample by measuring displacement of the scanning means in the direction of the second scanning axis or the third scanning axis and

outputting a feedback signal based on the detected position and displacement, the feedback signal being used for controlling the probe position; a storage device for storing detection results of the displacement detection means; and a computer for generating an observation image of the sample surface based on the relative position or displacement of the probe with respect to the sample for each of the scanning axes saved in the storage device;

wherein the displacement detection means simultaneously detects the relative position or displacement of the probe with respect to the sample in the direction of the first scanning axis, the second scanning axis and the third scanning axis;

wherein the scanning control means performs raster scanning control such that a scanning range of the sample surface in a direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis is larger than and includes a range of the sample surface being observed;

wherein the displacement detection means commences sampling and storage of relative position and displacement values of the probe relative to the sample in a direction of the first scanning axis, the second scanning axis and the third scanning axis at a predetermined sampling period, at the

time the relative position and displacement of the probe with respect to the sample in a direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis enter a range being observed; and

wherein the scanning control means receives the feedback signal and performs feedback control in accordance therewith so that rate of change over time of the relative position and displacement of the probe with respect to the sample in the direction of a scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis of the raster scanning become a set value until the relative position and displacement of the probe with respect to the sample in the direction of the scanning axis having the higher scanning frequency enter a range being observed.

12. (previously presented) A scanning probe microscope which observes microscopic structures on a sample surface, comprising: a probe responsive to an atomic force generated when brought into close proximity to the sample surface; scanning means for performing raster scanning of the probe along a first scanning axis substantially parallel to the sample surface and a second scanning axis substantially

parallel to the sample surface and orthogonal to the first scanning axis of the sample surface and maintaining the probe in close proximity to the sample to cause the probe to move relatively in the direction of a third scanning axis orthogonal to both the first scanning axis and the second scanning axis so as to follow undulations on the sample surface; scanning control means for controlling relative raster scanning of the probe with respect to the sample; displacement detection means for measuring relative position and displacement of the probe relative to the sample by measuring displacement of the scanning means in the direction of the second scanning axis or the third scanning axis and outputting a feedback signal based on the detected position and displacement, the feedback signal being used for controlling the probe position; and a storage device for storing detection results of the displacement detection means; and a computer for generating an observation image of the sample surface based on the relative position or displacement of the probe with respect to the sample for each of the scanning axes saved in the storage device;

wherein the displacement detection means simultaneously detects the relative position or displacement of the probe with respect to the sample in the direction of the first scanning axis, the second scanning axis and the third scanning axis;

wherein the scanning control means performs raster scanning control such that a scanning range of the sample surface in a direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis is larger than and includes a range of the sample surface being observed;

wherein the displacement detection means commences sampling and storage of relative position and displacement values of the probe relative to the sample in a direction of the first scanning axis, the second scanning axis and the third scanning axis at a predetermined sampling period, at the time the relative position and displacement of the probe with respect to the sample in a direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis enter a range being observed; and

wherein the scanning control means receives the feedback signal and controls an amount of displacement of the probe in a direction of the scanning axis having the higher scanning frequency to be larger than a region to be observed so that rate of change over time of the relative position and displacement of the probe with respect to the sample in the direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning

axis of the raster scanning become constant until the relative position and displacement of the probe with respect to the sample in the direction of the scanning axis having the higher scanning frequency enter a range being observed.

13. (canceled).

14. (previously presented) A scanning probe microscope according to claim 1; wherein the scanning speed adjustment means adjusts the relative speed of the probe with respect to the sample in the direction of the scanning axis having the higher high scanning frequency of the first scanning axis and the second scanning axis of the raster scanning so that a control error in the direction of the third scanning axis is minimized.

15. (previously presented) A scanning probe microscope according to claim 1; wherein the scanning speed adjustment means keeps constant the relative position or displacement of the probe with respect to the sample in the direction of the scanning axis having the lower scanning frequency of the first scanning axis and the second scanning axis of the raster scanning.

16. (previously presented) A scanning probe microscope according to claim 1; wherein the scanning speed

adjustment means adjusts the relative speed of the probe with respect to the sample in the direction of the scanning axis having the higher scanning frequency of the first scanning axis and the second scanning axis of the raster scanning so that an absolute value of a control error in the direction of the third scanning axis is minimized.

17. (previously presented) A probe scanning microscope according to claim 16; wherein the sampling pulse generating means generates a sampling pulse every time the relative position or displacement of the probe with respect to the sample in the direction of the scanning axis having the higher frequency of the first scanning axis and the second scanning axis of the raster scanning become a predetermined value.

18. (previously presented) A scanning probe microscope according to claim 1; wherein the scanning means comprises an XYZ translator for receiving an output voltage of the scanning control means and controlling the position of the probe in accordance therewith.

19. (previously presented) A scanning probe microscope according to claim 18; wherein the scanning control means controls a voltage applied to the XYZ translator in

order to cause raster scanning of the probe relatively across the sample surface.

20. (previously presented) A scanning probe microscope according to claim 18; wherein the XYZ translator comprises a piezoelectric element displaceable in the direction of the three scanning axes.

21. (previously presented) A scanning probe microscope according to claim 1; wherein the probe is a cantilever probe.

22. (previously presented) A scanning probe microscope according to claim 21; further comprising a deflection detector for detecting deflection of the cantilever probe during scanning movement of the probe across the sample surface.

23. (previously presented) A scanning probe microscope according to claim 22; further comprising a computer for producing an image of the sample surface in accordance with outputs of the displacement detection means and the deflection detector.

24. (currently amended) A scanning probe microscope according to claim 1; ~~4,~~ wherein the scanning control means

performs raster scanning control so that a scanning range of the sample in the direction of the scanning axis having the higher scanning frequency is larger than and includes a range of the sample surface being observed.

25. (currently amended) A scanning probe microscope comprising: a probe; an XYZ translator for causing the probe to undergo relative scanning movement with respect to a sample surface along first and second orthogonal axes substantially parallel to a sample surface to cause the probe to undergo movement along a third axis orthogonal to the first and second axes in response to undulations on the sample surface, displacement of the probe in the third axis being used to produce an image of the sample surface, and a scanning speed of the probe relative to the sample being lower along the second axis than along the first axis; a displacement detector for detecting displacement of the XYZ translator in the direction of the second axis and outputting a feedback signal in accordance therewith for controlling the relative position of the probe with respect to the sample surface along the second axis; and scanning control means for controlling the XYZ translator in accordance with the feedback signal to maintain the probe position constant along the second axis during either an entire period or a portion of a period of

scanning along the first axis; wherein the scanning control means comprises scanning speed adjustment means for adjusting the speed of the scanning in the direction of the first axis so that a control error in the direction of the third axis is minimized, and sampling pulse generating means for generating sampling pulses for sampling the position of the probe at predetermined times.

26. (canceled).

27. (currently amended) A scanning probe microscope according to claim 25; ~~26;~~ wherein the scanning control means controls the XYZ translator to scan the probe along the first axis in a range that is larger than a range of the sample surface that is intended to be observed.

28. (previously presented) A scanning probe microscope according to claim 27; wherein the displacement detector commences sampling of probe displacement values when the position of the probe in the direction of the first axis enters the range intended to be observed.

29. (canceled).

30. (canceled).

31. (canceled).

32. (canceled).

33. (canceled).

34. (previously presented) A scanning probe microscope according to claim 25; wherein the scanning speed adjustment means maintains the probe position constant in the direction of the axis having the lower scanning frequency of the first and second scanning axes.

35. (previously presented) A scanning probe microscope according to claim 25; wherein the scanning speed adjustment means adjusts the relative speed of the probe in the direction of the axis having the higher scanning frequency of the first and second axes so that an absolute value of a control error in the direction of the third axis is minimized.

36. (previously presented) A probe scanning microscope according to claim 35; wherein the sampling pulse generating means generates a sampling pulse every time the probe position in the direction of the axis having the higher scanning frequency becomes a predetermined value.